Claims

What is claimed is:

1. An apparatus, comprising:

a unitary layer of electrically non-conductive material having a first surface adjacent a heat sink, a second surface adjacent a heat source, and a plurality of openings communicatively coupled between the first surface and the second surface, wherein a combined area the plurality of openings comprises a selected percentage of the first surface.

2. The apparatus of claim 1, wherein selected ones of the plurality of openings comprise a regular geometric shape.

3. The apparatus of claim 2, wherein the regular geometric shape is substantially circular.

4. The apparatus of claim 2, wherein the regular geometric shape is substantially square.

5. The apparatus of claim 1, wherein selected ones of the plurality of openings comprise an irregular geometric shape.

6. The apparatus of claim 1, wherein the combined area of the plurality of openings comprises at least about 90% of the first surface.

7. The apparatus of claim 1, wherein the combined area of the plurality of openings comprises no more than about 95% of the first surface.

8. The apparatus of claim 1, wherein the combined area of the plurality of openings comprises a selected percentage of the first surface and the second surface, wherein the selected percentage of the second surface is different from the selected percentage of the first surface.

9. The apparatus of claim 1, wherein the unitary layer of electrically non-conductive material comprises:
a polymer.

10. The apparatus of claim 1, further comprising:
a thermal interface material located between the unitary layer of electrically non-conductive material and the heat sink.

11. The apparatus of claim 1, wherein the unitary layer of electrically non-conductive material comprises:
a non-woven material.

12. The apparatus of claim 1, wherein the unitary layer of electrically non-conductive material comprises:
a plurality of glass beads.

13. The apparatus of claim 1, further comprising:
a thermally conductive material located in selected ones of the plurality of openings, the thermally conductive material selected from at least one of a solid, a liquid, and a paste.

14. An apparatus, comprising:
a heat source;
a heat sink; and

a unitary layer of electrically non-conductive material having a first surface adjacent the heat sink, a second surface adjacent the heat source, and a plurality of openings communicatively coupled between the first surface and the second surface, wherein a combined area of the plurality of openings comprises a selected percentage of the first surface.

15. The apparatus of claim 14, wherein the unitary layer of electrically non-conductive material comprises:
a polymer.

16. The apparatus of claim 14, wherein the unitary layer of electrically non-conductive material has a substantially uniform thickness of about 0.05 mm.

17. The apparatus of claim 14, further comprising:
a thermal interface material located between the unitary layer of electrically non-conductive material and the heat source.

18. The apparatus of claim 14, wherein the heat source comprises an integrated circuit package including a transponder.

19. The apparatus of claim 14, wherein the heat source comprises a die.

20. The apparatus of claim 14, wherein the heat sink comprises a heat spreader.

21. The apparatus of claim 14, wherein the combined area of the plurality of openings comprises no more than about 90% of the first surface.

22. The apparatus of claim 14, wherein the combined area of the plurality of openings comprises no more than about 95% of the first surface.

23. A system, comprising:

a wireless transceiver;

a die including a die surface and a circuit electrically coupled to the wireless transceiver;

a heat sink; and

a unitary layer of electrically non-conductive material having a first surface adjacent the heat sink, a second surface adjacent the die surface, and a plurality of openings communicatively coupled between the first surface and the second surface, wherein a combined area of the plurality of openings comprises a selected percentage of the first surface.

24. The system of claim 23, wherein the wireless transceiver comprises:

a transponder.

25. The system of claim 23, wherein the unitary layer of electrically non-conductive material comprises:

a polymer.

26. A method, comprising:

coupling a heat sink to a first surface of a unitary layer of electrically non-conductive material; and

coupling a heat source to a second surface of the unitary layer of electrically non-conductive material, wherein the unitary layer of electrically non-conductive material has a plurality of openings communicatively coupled between the first surface and the second surface, and wherein a combined area of the plurality of openings comprises a selected percentage of the first surface.

27. The method of claim 26, further comprising:

applying a thermally conductive material selected from at least one of a solid, a liquid, and a paste to selected ones of the plurality of openings.

28. The method of claim 26, further comprising:
compressing the unitary layer of electrically non-conductive material between the heat sink and the heat source.

29. The method of claim 26, wherein the unitary layer of electrically non-conductive material comprises:
a polymer.

30. The method of claim 26, further comprising:
coupling a wireless transceiver to a circuit included in the die.